

```

# from Ito and Houston (2004)
calc_Hepatic_Clearance <- function(Params)
{
  CLint <- get_param("CLint",Params,"calc_Hepatic_Clearance") # uL/min/10^6 cells
  fub <- get_param("fub",Params,"calc_Hepatic_Clearance") # unitless fraction
  Qhc <- get_param("Qhc",Params,"calc_Hepatic_Clearance",default=20.7) # L/h/kgBW
  liver.volume.per.kgBW <- get_param("liver.volume.per.kgBW",Params,"calc_Hepatic_Clearance") #
  L/kg BW
  tissue.density <- get_param("tissue.density",Params,"calc_Hepatic_Clearance") # g/mL
  Dn <- get_param("Dn",Params,"calc_Hepatic_Clearance",default=0.17) #
  model <- get_param("model",Params,"calc_Hepatic_Clearance",default="well-stirred")
  million.cells.per.gliver <- get_param("million.cells.per.gliver",Params,"calc_Hepatic_Clearance") # 10^6
  cells/g-liver

  if (!(model %in% c("well-stirred","parallel tube","dispersion")))
    stop("Model other than \"well-stirred,\" \"parallel tube,\" or \"dispersion\" specified.")

  # Convert from uL/min/10^6 cells to uL/min/g-liver to uL/min/kg BW
  CLint <- CLint*million.cells.per.gliver
  # Convert from uL/min/g-liver to uL/min/kg BW
  CLint <- CLint*(liver.volume.per.kgBW*1000*tissue.density)
  # Convert from uL/min/kg BW to L/h/kg BW
  CLint <- CLint/10^6*60

  if (model == "well-stirred")
    CLh <- Qhc*fub*CLint/(Qhc+fub*CLint)
  else if (model == "parallel tube")
    CLh <- Qhc*(1-exp(-fub*CLint/Qhc))
  else if (model == "dispersion")
  {
    Rn <- fub*CLint/Qh
    a <- sqrt(1 + 4*Rn*Dn)
    CLh <- Qhc*(1 - 4*a/((1+a)^2*exp((a-1)/2/Dn)-(1-a)^2*exp(-(a+1)/2/Dn)))
  }

  return(CLh) # L/h/kg BW
}

```